

BOVIS LEND LEASE

TRANSPORT REPORT FOR PROPOSED
WALLACE WURTH REDEVELOPMENT,
UNIVERSITY OF NSW

JUNE 2010

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I. INTRODUCTION

- I.1 Colston Budd Hunt and Kafes Pty Ltd has been commissioned by Bovis Lend Lease to prepare a report examining the transport implications of proposed alterations and additions to the Wallace Wurth building at the University of New South Wales' Kensington campus west of Botany Street. The location of the proposed development is shown in Figure I.
- I.2 A Development Control Plan has been prepared for future development at the University. The proposed Wallace Wurth redevelopment sits within the context of this DCP.
- I.3 The Wallace Wurth building is at C27 on the university's upper campus. It currently provides some 12,800m² and is used by the Faculty of Medicine. The proposed redevelopment will extend the building as well as upgrade the existing building. New and upgraded teaching areas, dry and wet research laboratories, animal housing areas and administration areas will be provided, similar to the existing uses. The proposed extension will provide an additional some 8,000m².
- I.4 The Director – General's Environmental Assessment Requirements for the project include:

3. *Impacts on Existing Uses*

- *Details of the status of the existing buildings and how it is intended to relocate or displace existing uses temporary or otherwise, possible future expansion areas, vehicular car parking (location and numbers), access and delivery areas and proposed road closures.*
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5. *Transport and Accessibility Impacts (Construction and Operational)*

- *A detailed transport, traffic and parking impact assessment to address the following matters:*
 - *transport/parking objectives and the transport/parking provisions as documented in Section 5.10 of the UNSW Kensington Campus DCP. Particular reference is made to transport/parking provisions in Section (e) and the need for the proponent to fully document whether the project will involve an increase in staff, student or other visitations to campus or is purely an upgrade of existing facilities;*
 - *Demonstrate how users of the development will be able to make travel choices that support the achievement of relevant State Plan targets;*
 - *daily and peak traffic movements likely to be generated by the proposed development including the impact on nearby intersections and the need/associated funding for upgrading or road improvement works (if required);*
 - *details of the proposed access and the parking provisions associated with the proposed development including compliance with the requirements of the relevant Australian Standards (i.e. driveways, turn paths, sight distance requirements, aisle widths, space dimensions, etc);*
 - *the proposed number of car parking spaces is to comply with the appropriate parking codes. As this area is serviced well by public transport, it should be ensured the parking provision is kept to the minimum.*
 - *Details of service vehicle movements (including vehicle type and likely arrival and departure times);*
 - *Implication of the proposed development for non-car travel modes (including public transport use, walking and cycling); the potential for implementing a location-specific travel plan (e.g. 'Travelsmart' or other travel behaviour change initiative); and the provision of facilities to increase the non-car mode share for travel to and from the site. This will entail an assessment of the accessibility of the development site by public transport. However, an assessment of the impact of increase patronage demand on the existing public transport system as a result of the proposed development and above initiative would also be required.*
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- *assessment of the likely toxicity levels of loads transported on arterial and local roads to/from the site and, consequently, the preparation of an incident management strategy for crashes involving such loads, if relevant.*
- *A construction traffic management plan demonstrating how construction and delivery vehicles will access the development site during the demolition and construction phase of the development.*

17. Consultation

- *Undertake an appropriate and justified level of consultation in accordance with the relevant local, State or Commonwealth government authorities, service providers, community groups or affected landowners. In particular, you must consult with the:*
 - *Roads and Traffic Authority; and*
 - *Sydney Airport Corporation Ltd.*

1.5 This report assesses the transport implications of the proposed development through the following chapters:

- Chapter 2 - describing the existing conditions; and
- Chapter 3 - assessing the implications of the proposed development.

2. EXISTING CONDITIONS

Site Location and Road Network

- 2.1 The main campus of the UNSW is located in Kensington, predominantly on a block bounded by High Street to the north, Barker Street and Oval Lane to the south, Botany Street and Willis Street to the east and Anzac Parade to the west.
- 2.2 The Wallace Wurth building is on the north-eastern corner of the campus, fronting High Street and Botany Street, on the university's 'upper campus' (location C27). The Biological Sciences building is south of the site, and the new Cancer Research building is west of the site. The site location is shown in Figure 1.
- 2.3 The existing Wallace Wurth building provides some 12,800m² and is used by the Faculty of Medicine. It includes teaching areas, dry and wet research laboratories, animal housing and administration areas.
- 2.4 There is a loading dock provided for the building, which is accessible from Botany Street via Gate 10. The loading dock is at the southern end of the building.
- 2.5 The main vehicular access to parking and loading areas on the upper part of the campus in the vicinity of the site is provided from Botany Street, via a driveway at Gate 11. Gate 11 provides vehicular access to the Botany Street multi-level car park, and the loading dock for the Biological Sciences building. The Biological Sciences loading dock also accommodates deliveries to the Cancer Research building, via a services tunnel. Chancellery Walk is a north-south pedestrian link through the eastern part of the campus, adjacent to the Wallace Wurth building.
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- 2.6 A gatehouse is located at Gate 11. The gatehouse separates the driveway entry and exit lanes at Botany Street. Two exit lanes are provided for simultaneous left and right turns onto Botany Street.
- 2.7 The major land uses in the vicinity of the university site include Randwick Racecourse to the north-west, The Prince of Wales Hospital and Randwick shopping areas to the east, mixed use and residential development to the south and the remainder of the university campus to the west.
- 2.8 Botany Street provides vehicular access to the university and other adjacent development. It intersects High Street at a signalised intersection at the north-eastern corner of the campus. Botany Street provides for one traffic lane and one parking lane in each direction, clear of intersections. There is a turn bay in Botany Street for right turns into Gate 11.

Development Control Plan

- 2.9 A DCP has been prepared to guide future development at the university (Campus 2020 UNSW Kensington Campus Development Control Plan). The DCP includes a number of provisions in relation to transport and parking, including the following:
- reducing travel by private car and reducing on-site parking;
 - annual surveys of travel behaviour;
 - working with bus and rail operators to improve public transport services;
 - introducing resident and short term parking on streets around the campus;
 - measures to determine and manage future on-site parking provision; and
 - measures to encourage walking, cycling and public transport at the campus.
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2.10 A number of measures have been implemented by the university in the last two years (in conjunction with service providers) to help achieve these objectives. These measures have included:

- additional bus services being operated by Sydney Buses to serve the campus, including pre-paid services to and from Central Station and the new 348 service between Bondi Junction, UNSW, Alexandria and Wolli Creek Station introduced in April 2009;
- ticket facilities and a loading marshal at the Anzac Parade bus stop;
- carpooling scheme introduced in May 2009 for staff and students;
- annual increases in parking charges on the campus;
- new post graduate student accommodation of some 300 beds on Anzac Parade; and
- new student accommodation of some 1,030 beds on High Street (opened in 2010).

Traffic Flows

2.11 In order to gauge traffic conditions, traffic counts were undertaken during weekday morning and afternoon peak periods at the intersection of Botany Street with Gates 10 (loading dock for Wallace Wurth building) and 11. The results of the surveys are shown in Figure 2, and summarised in Table 2.1.

Table 2.1: Existing two-way (sum of both directions) peak hour traffic flows			
Road	Location	AM peak hour	PM peak hour
Botany Street	North of Gate 11	1,485	1,370
	South of Gate 11	1,395	1,230
Gate 11 access	West of Botany Street	530	400
Gate 10 access	West of Botany Street	4	2

- 2.12 Table 2.1 shows that Botany Street carried some 1,250 to 1,500 vehicles per hour two-way. The Gate 11 access carried lower flows of some 400 to 550 vehicles per hour two-way at peak times. The Gate 10 access to the Wallace Wurth loading dock carried low traffic flows, with some four and two vehicles observed during the morning and afternoon peak hours respectively.

Intersection Operation

- 2.13 The capacity of the road network is largely determined by the capacity of its intersections to cater for peak period traffic flows. The operation of the intersection of Botany Street with the Gate 11 access has been analysed using the SIDRA program. SIDRA simulates the operations of intersections to provide a number of performance measures. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle. Based on average delay per vehicle, SIDRA estimates the following levels of service (LOS):

- For traffic signals, the average delay per vehicle in seconds is calculated as delay/(all vehicles), for roundabouts the average delay per vehicle in seconds is selected for the movement with the highest average delay per vehicle, equivalent to the following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Good with minimal delays and spare capacity
29 to 42	=	"C"	Satisfactory with spare capacity
43 to 56	=	"D"	Satisfactory but operating near capacity
57 to 70	=	"E"	At capacity and incidents will cause excessive delays. Roundabouts require other control mode.
>70	=	"F"	Unsatisfactory and requires additional capacity

- For give way and stop signs, the average delay per vehicle in seconds is selected from the movement with the highest average delay per vehicle, equivalent to following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Acceptable delays and spare capacity
29 to 42	=	"C"	Satisfactory but accident study required
43 to 56	=	"D"	Near capacity and accident study required
57 to 70	=	"E"	At capacity and requires other control mode
>70	=	"F"	Unsatisfactory and requires other control mode

2.14 It should be noted that for roundabouts, give way and stop signs, in some circumstances, simply examining the highest individual average delay can be misleading. The size of the movement with the highest average delay per vehicle should also be taken into account. Thus, for example, an intersection where all movements are operating at a level of service A, except one which is at level of service E, may not necessarily define the intersection level of service as E if that movement is very small. That is, longer delays to a small number of vehicles may not justify upgrading an intersection unless a safety issue was also involved.

2.15 The SIDRA analysis found that the intersection of Botany Street with the Gate 11 access is operating with average delays, for the highest delayed movement, of less than 28 seconds per vehicle. This represents level of service B, a reasonable level of service.

Public Transport

- 2.16 The campus is well served by buses which operate along Anzac Parade, High Street, Botany Street, Avoca Street and Day Avenue. There are bus stops on these roads serving the university, including major bus stops on Anzac Parade and High Street.
- 2.17 Sydney Buses operates numerous routes serving the university, including the 302, 303, 341, 348, 357, 370, 391, 392, 393, 394, 395, 396, 397, 399, 400, 410, 890, 891, 892 and 895. These routes provide links to surrounding areas, the city, Bondi Junction, Circular Quay and Central Station. The 891/5 services are express services between Central and the university. Overall, the site has excellent access to regular public transport services.
- 2.18 The university has a policy to encourage travel by public transport, walking and cycling as an alternative to private car use. There is a transport coordinator who is responsible for activities to improve transport access and sustainability. There are programs in place such as car pooling, provision of travel information, staff travel passes and travel demand management.
- 2.19 As discussed above, a number of measures have been implemented in the last two years to improve public transport access to the university and reduce dependency on private motor vehicles.
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3. IMPLICATIONS OF PROPOSED DEVELOPMENT

3.1 The proposed Wallace Wurth redevelopment will extend as well as upgrade the existing building. New and upgraded teaching areas, dry and wet research laboratories, animal housing areas and administration areas will be provided, similar to the existing uses. The proposed extension will provide an additional some 8,000m².

3.2 This chapter assesses the implications of the proposed development through the following sections:

- ❑ pedestrians and public transport;
- ❑ parking provision;
- ❑ access and servicing;
- ❑ traffic effects;
- ❑ principles of construction traffic management;
- ❑ Director-General's requirements; and
- ❑ summary.

Pedestrians and Public Transport

3.2 As previously discussed, the site has excellent access to bus services which operate along Anzac Parade, High Street, Botany Street, Avoca Street and Day Avenue. Bus services provide links to surrounding areas, the city, Bondi Junction, Circular Quay and Central and Town Hall railway stations.

3.3 The proposed extended and upgraded building would be close to existing good public transport services, and would therefore be readily accessible by public

transport. The university will continue to promote the use of public transport as an alternative to private cars and implement programs to manage travel demand.

3.4 Providing services and facilities close to existing good public transport services is in accordance with government policy and the planning principles of:

- improving accessibility to employment by public transport;
- improving the choice of transport and reducing dependence solely on cars for travel purposes;
- moderating growth in the demand for travel and the distances travelled, especially by car; and
- supporting the efficient and viable operation of public transport services.

3.5 The emphasis of travel to and from the university by public transport is reinforced in the DCP which identifies a number of short, medium to longer term measures to improve public transport access at the university. A number of these measures have been implemented in the last two years, including:

- additional bus services being operated by Sydney Buses to serve the campus, including pre-paid services to and from Central Station and the new 348 service between Bondi Junction, UNSW, Alexandria and Wolli Creek Station introduced in April 2009;
 - ticket facilities and a loading marshall at the Anzac Parade bus stop;
 - carpooling scheme introduced in May 2009 for staff and students;
 - annual increases in parking charges on the campus;
 - new post graduate student accommodation of some 300 beds on Anzac Parade; and
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- new student accommodation of some 1,030 beds on High Street (opened in 2010).

3.6 The existing pedestrian links along High Street, Botany Street and Chancellery Walk will provide pedestrian access to the facility. A new major pedestrian connection will be provided between the Wallace Wurth and Biological Sciences buildings, at the eastern end of University Walk, as identified in the DCP. No changes to bus stops on High Street or Botany Street are proposed.

Parking Provision

3.7 The DCP states the following in relation to parking provision:

“The total number of parking spaces on campus is to be maintained until such time as it is demonstrated through the annual parking survey that the total number may be reduced without adversely impacting parking on the surrounding streets.

In the event of development that would increase the total population of staff or students then the prevailing mode of travel and distribution of parking (as measured in the latest survey) to be used to assess the future travel patterns and parking demand. The additional campus population arising from the development to be considered as the same proportion of the existing peak population (at 11:00 am weekdays) of students and staff to the total number of students and staff respectively.”

3.8 The DCP requires the university to undertake annual travel and parking surveys on the campus. The most recent survey was conducted by the university in 2009.

3.9 Results of the most recent survey, as well as previous surveys undertaken by the university in 2008 and 2007, are summarised in Table 3.1.

Table 3.1: UNSW Travel Survey Results

Mode of travel	2007	2008	2009
Car driver	29%	23%	22%
Car passenger	2%	2%	2%
Motorcycle	1%	1%	1%
Sub-total	32%	26%	25%
Bus	17%	19%	20%
Train/bus	32%	35%	37%
Sub-total	49%	54%	57%
Bicycle	3%	3%	4%
Walk	14%	15%	13%
Live on campus	2%	2%	1%
Sub-total	19%	20%	18%

- 3.10 Over the three survey years, the proportion of students and staff travelling to and from the university by car and motorcycle has reduced from some 32 per cent in 2007 to some 26 per cent in 2008 and some 25 per cent in 2009.
- 3.11 Correspondingly, there has been an increase in the proportion of students and staff travelling to the university by bus and train from 49 per cent in 2007 to 54 per cent in 2008 and 57 per cent in 2009.
- 3.12 The proportion of students and staff travelling by bicycle, walking or living on campus during the same period was some 19 per cent in 2007, 20 per cent in 2008 and 18 per cent in 2009.
- 3.13 Therefore, over the three years, there has been a reduction in the proportion of people driving to the campus and a trend towards public transport.

- 3.14 No parking spaces are proposed to be provided on the campus in association with the proposed development. This is consistent with the DCP objectives which provide for a reduction in parking on the campus in association with a shift away from private car travel to and from the campus. The proposed development is therefore consistent with the DCP and its objectives, as well as other recent approvals on the campus such as the SIRF building.

Access and Servicing

- 3.15 Vehicular access to UNSW via Gate 11 will continue to be provided from Botany Street. No changes are proposed to the existing access arrangements.
- 3.16 In association with the proposed building extension, it is proposed to close Gate 10 and remove the existing loading dock. This will remove a point of vehicular access to the campus from Botany Street.
- 3.17 Servicing of the development is proposed to occur from the existing Biological Sciences loading dock. Service vehicles will enter the Biological Sciences loading dock through Gate 11, as they do currently.
- 3.18 The proposed service vehicle arrangements are similar to those which operate for the existing Cancer Research building adjacent to the Wallace Wurth Building.
- 3.19 In order to gauge the existing level of activity in the Wallace Wurth loading dock, surveys of the operation of the dock were undertaken over a typical day. The surveys found that over the day, five vehicles accessed the existing Wallace Wurth loading dock from Gate 10.
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- 3.20 With an increase in the size of the building, a small increase in the number of deliveries (less than five per day) is expected to the dock.
- 3.21 This small number will be readily accommodated through Gate 11 and the existing Biological Sciences loading dock.

Traffic Effects

- 3.22 Between now and 2020, there is expected to be a gradual increase in employee numbers in the Faculty of Medicine from some 1,080 (existing) to 1,980. While student numbers are expected to increase in the building, the majority of these will be relocated from other areas on the campus.
- 3.23 However, as the overall parking supply on the campus is not proposed to increase, it is likely that traffic generation through Gate 11 will not change.
- 3.24 There will be a small redistribution of traffic from Gate 10 (the existing Wallace Wurth loading dock) to Gate 11 associated with service vehicles to the development. This redistribution would be in the order of some 10 vehicles per day two-way. In the context of existing traffic flows through Gate 11, this redistribution would not be noticeable.
- 3.25 Therefore, the intersection of Botany Street with the Gate 11 access would continue to operate at its existing reasonable level of service or better, with similar average delays per vehicle.
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Principles of Construction Traffic Management

- 3.26 At this stage the overall construction methodology, process and staging has not been defined. The builder will be responsible for the preparation of a traffic management plan, which will be prepared prior to the commencement of work, taking into account relevant consent conditions.
- 3.27 Construction of the development will commence with site preparation works and relocation of people from the first area of construction/refurbishment. As areas within the building are progressively completed, people will be relocated to these parts of the building.
- 3.28 Construction access will be provided to/from Botany Street using the existing site driveway at Gate 10 and another location further north. It is anticipated that works zones will be required along the site frontages on Botany Street and High Street.
- 3.29 Pedestrian footpaths adjacent to the site will be maintained during the construction period. Class A construction fencing will be erected around the perimeter of the building, with overhead protection where required.
- 3.30 Openings in the construction fencing, and at the construction access driveways will be managed and controlled by qualified site personnel. The movement of trucks entering and exiting the site will be managed and controlled by site personnel.
- 3.31 The overall principles for traffic management during construction of the development are:
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- provide a convenient and appropriate environment for pedestrians;
 - minimise effects on pedestrian movements and amenity;
 - provide appropriate safety fencing/hoardings around the perimeter of the construction site;
 - manage and control vehicular movements to and from the site;
 - provide works zones on Botany Street and High Street, adjacent to the site;
 - maintain other existing on-street parking in the vicinity of the site;
 - restrict construction vehicle activity to designated truck routes through the area (to be identified by the appointed builder);
 - construction vehicles to enter and exit the site in a forward direction;
 - construction activity to be carried out in accordance with the approved hours of construction;
 - maintain safety for workers; and
 - the preparation of the construction traffic management plan, signage detail, control of pedestrians and control and management of construction vehicles in the vicinity of the site will be the responsibility of the appointed builder.
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Director-General's Requirements

- 3.32 Many of the Director-General's requirements, such as parking provision, use of public transport and measures to reduce car travel are embodied in the site-specific DCP prepared for the campus. The matters raised by the Director-General have therefore already been included in the site planning principles identified in the DCP. They are discussed further below.

3. Impacts on Existing Uses

- *Details of the status of the existing buildings and how it is intended to relocate or displace existing uses temporary or otherwise, possible future expansion areas, vehicular car parking (location and numbers), access and delivery areas and proposed road closures.*
- 3.33 The relocation of existing uses in the building is being addressed by other study team members. No existing parking areas are being relocated or displaced. During construction, the existing loading dock would become part of the construction compound, and deliveries will be made using the Biological Sciences loading dock.
- 3.34 No roads are proposed to be closed. Once the building is completed, Gate 10 would be closed and deliveries would be permanently made from the Biological Sciences loading dock. The traffic effects of this change are discussed in paragraphs 3.24 and 3.25.
- *transport/parking objectives and the transport/parking provisions as documented in Section 5.10 of the UNSW Kensington Campus DCP. Particular reference is made to transport/parking provisions in Section (e) and the need for the proponent to fully document whether the project will involve an increase in staff, student or other visitations to campus or is purely an upgrade of existing facilities;*
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3.35 These matters are discussed in paragraphs 3.2 to 3.6 and 3.7 to 3.14. Employee numbers are discussed in paragraph 3.22.

- *Demonstrate how users of the development will be able to make travel choices that support the achievement of relevant State Plan targets;*

3.36 Choice of travel modes is discussed in paragraphs 2.16 to 2.19 and 3.2 to 3.6. State Plan targets are being addressed by other study team members.

- *daily and peak traffic movements likely to be generated by the proposed development including the impact on nearby intersections and the need/associated funding for upgrading or road improvement works (if required);*

3.37 These matters are discussed in paragraphs 3.22 to 3.25.

- *details of the proposed access and the parking provisions associated with the proposed development including compliance with the requirements of the relevant Australian Standards (i.e. driveways, turn paths, sight distance requirements, aisle widths, space dimensions, etc);*

3.38 No new parking areas are proposed. Access arrangements are discussed in paragraphs 3.15 to 3.17.

- *the proposed number of car parking spaces is to comply with the appropriate parking codes. As this area is serviced well by public transport, it should be ensured the parking provision is kept to the minimum.*

3.39 Parking provision is discussed in paragraphs 3.7 to 3.14.

- *Details of service vehicle movements (including vehicle type and likely arrival and departure times);*

3.40 Service vehicles are discussed in paragraphs 3.17 to 3.21.

- *Implication of the proposed development for non-car travel modes (including public transport use, walking and cycling); the potential for implementing a location-specific travel plan (e.g. 'Travelsmart' or other travel behaviour change initiative); and the provision of facilities to increase the non-car mode share for travel to and from the site. This will entail an assessment of the accessibility of the development site by public transport. However, an assessment of the impact of increase patronage demand on the existing public transport system as a result of the proposed development and above initiative would also be required.*

3.41 The Campus 2020 UNSW Kensington Campus Development Control Plan embodies a series of transport principles and measures which effectively provide a location-specific travel plan for the campus. Measures to increase non-car travel to and from the university are identified in the DCP and are progressively being implemented by the university in conjunction with service providers, as discussed in paragraphs 2.10 and 3.5.

- *assessment of the likely toxicity levels of loads transported on arterial and local roads to/from the site and, consequently, the preparation of an incident management strategy for crashes involving such loads, if relevant.*

3.42 As discussed in paragraphs 3.20, there should be little change to existing deliveries to the Wallace Wurth building as a result of the proposed development.

- *A construction traffic management plan demonstrating how construction and delivery vehicles will access the development site during the demolition and construction phase of the development.*

3.43 Construction traffic management is discussed in paragraphs 3.26 to 3.31.

- *Undertake an appropriate and justified level of consultation in accordance with the relevant local, State or Commonwealth government authorities, service providers, community groups or affected landowners. In particular, you must consult with the:*
 - *Roads and Traffic Authority; and*
 - *Sydney Airport Corporation Ltd.*

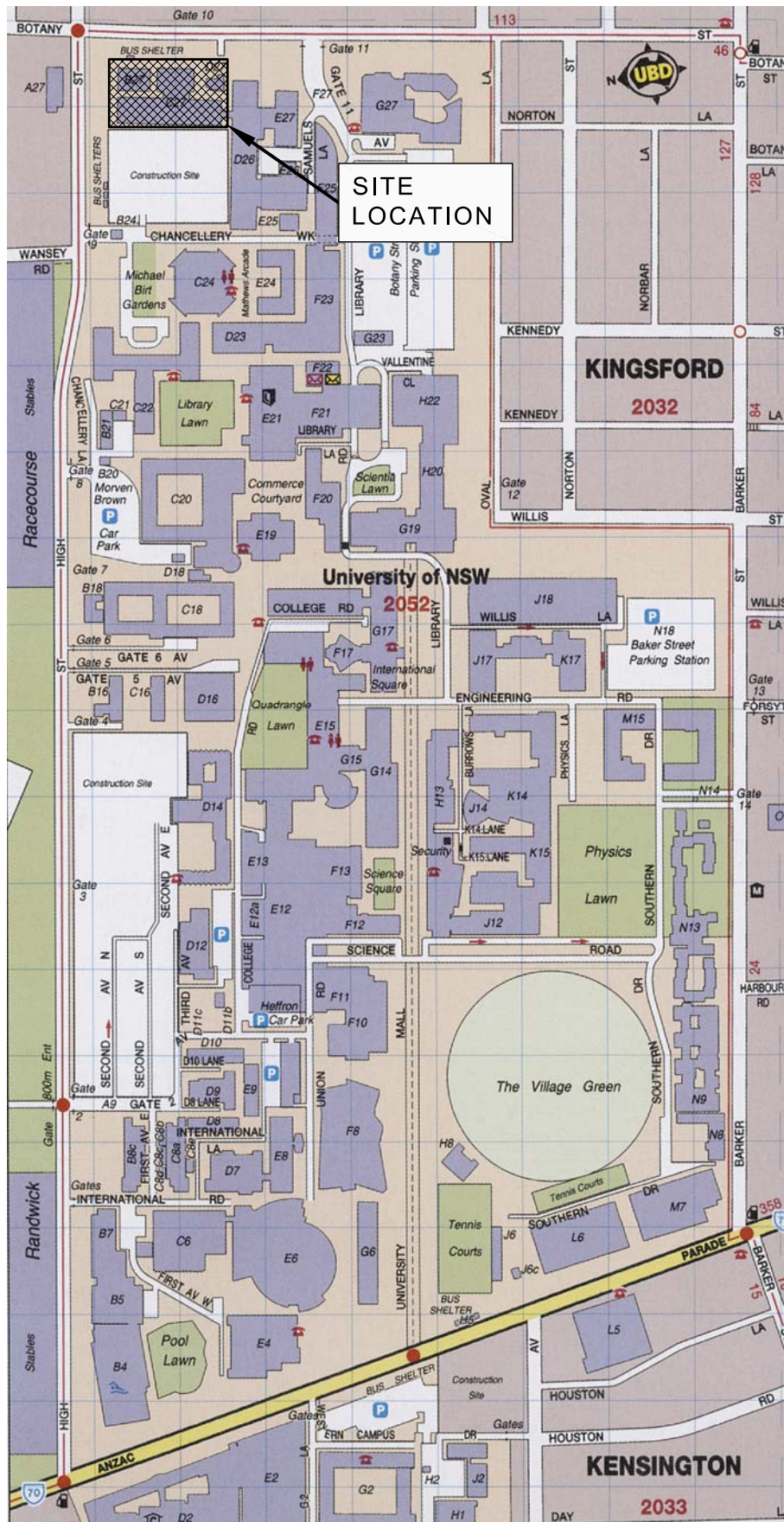
3.44 The RTA has provided a letter, dated 18 February 2010, in relation to the proposed development. The matters raised in the RTA's letter have been included in the Director-General's requirements for the project. The Director-General's requirements are discussed above.

Summary

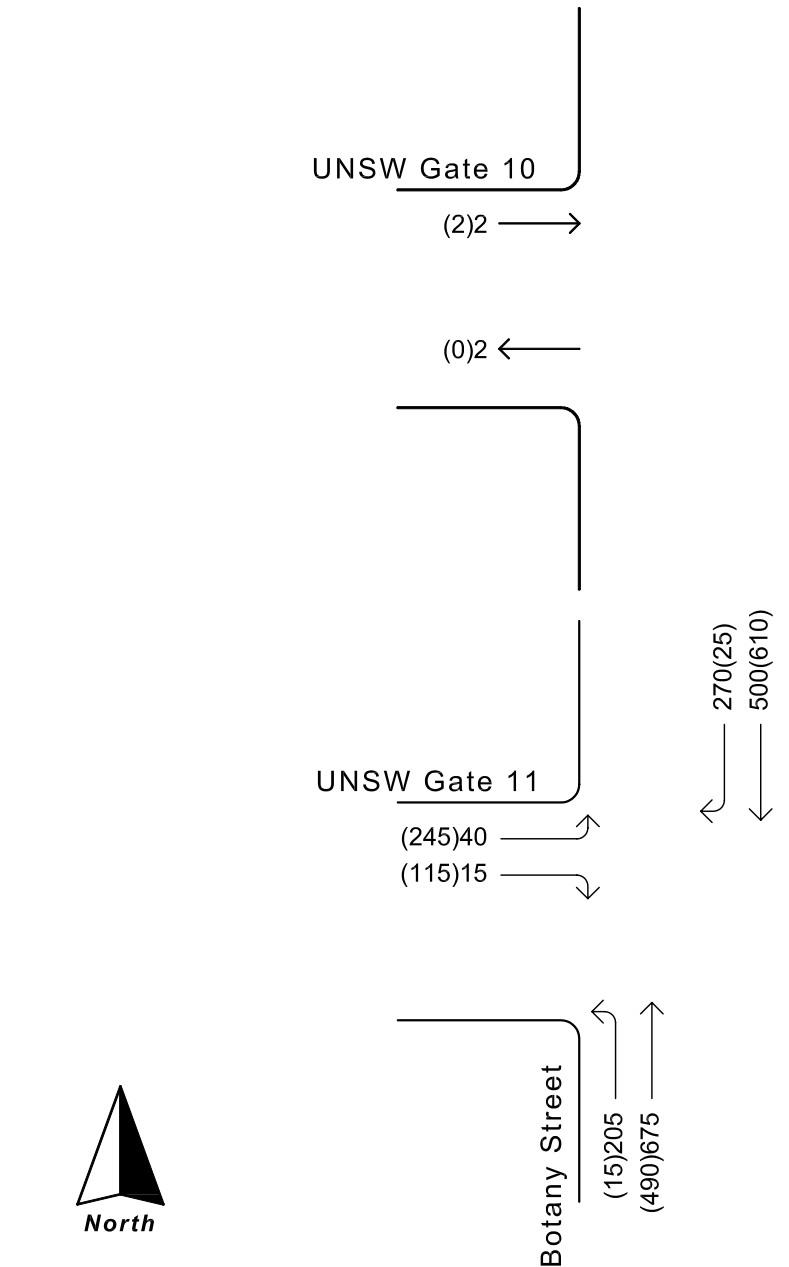
3.45 In summary, the main points relating to the transport implications of the proposed Wallace Wurth redevelopment are:

- i) the proposed redevelopment will provide similar facilities to the existing building, including teaching areas, dry and wet research laboratories, animal housing areas and administration areas;
 - ii) the proposed development will have good access to public transport services in accordance with government policy to encourage travel by non-car modes;
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- iii) good pedestrian access to and around the building will be provided;
- iv) parking provision on the campus is consistent with the DCP and its objectives;
- v) access and servicing arrangements are considered appropriate;
- vi) it is likely that the overall traffic generation of the campus will not change;
- vii) the intersection of Botany Street with the Gate 11 access would continue to operate at its existing reasonable level of service or better, with similar average delays per vehicle; and
- viii) the Director-General's requirements are discussed in paragraphs 3.32 to 3.44.



Location Plan



**Morning and afternoon peak hour
traffic flows**